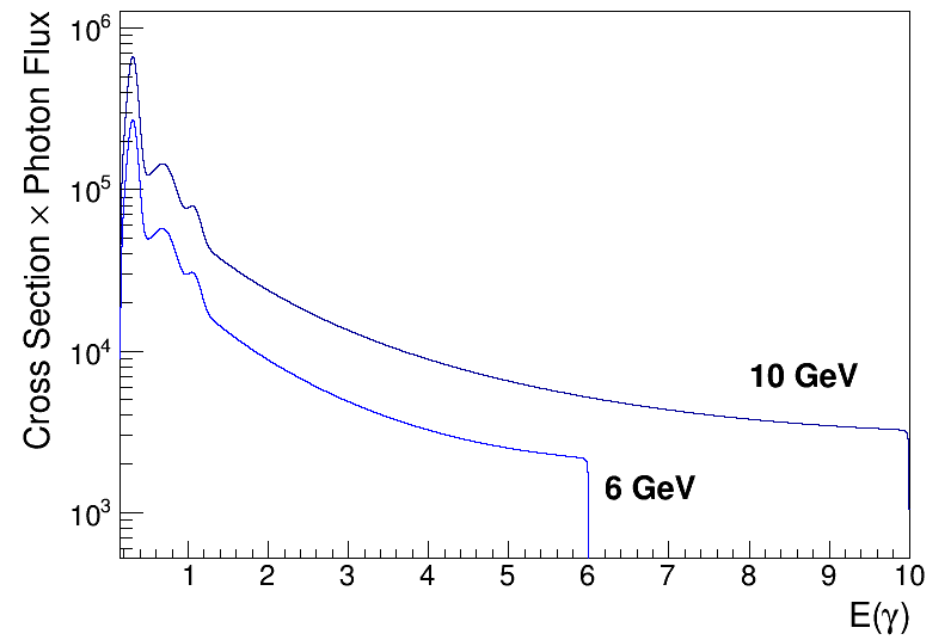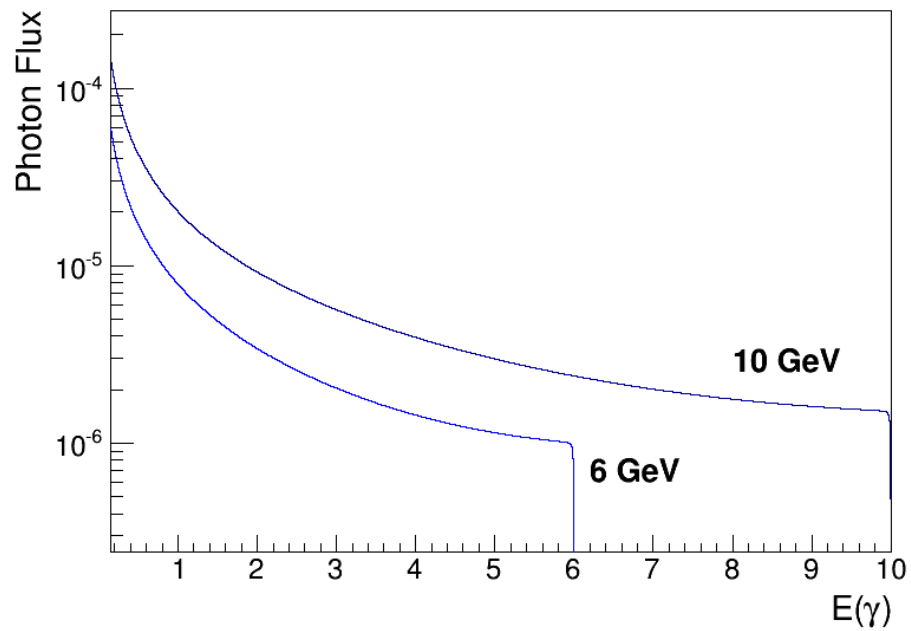# Selecting Events for Calibrations

- Need to understand the expected event rates and selection criteria needed to extract calibrations from photon beam data.

- Generated bggen events:
  - Incoherent photon beam spectrum, full energy range
  - Photon rate 10^6 γ/s
  - 6/10 GeV e⁻ beam → 1.0/2.8 kHz interaction rate
  - No trigger considered, but only selected daughter particles with momentum > 500 MeV.

- Analyzed the following channels:
  - $K_S \rightarrow \pi^+ \pi^-$ $\Lambda \rightarrow p \pi^-$ $\phi \rightarrow K^+ K^-$
  - $K^* \rightarrow K^+ \pi^-$ $\pi^0 \rightarrow \gamma \gamma$ $\eta \rightarrow \gamma \gamma$
  - $\omega \rightarrow \pi^+ \pi^- \pi^0$ $\gamma p \rightarrow \pi^+ \pi^- \pi^0 p$

Photon Flux and Cross Section

Generator Level Event Rates

- $K_S \rightarrow \pi^+ \pi^-$ 0.80/ 2.3 Hz   2.9/8.4 x 10^3 /hour
- $\Lambda \rightarrow p \, \pi^-$ 0.11/0.30 Hz   0.39/1.1 x 10^3 /hour
- $\phi \rightarrow K^+ K^-$ 0.26/0.77 Hz   0.95/2.8 x 10^3 /hour
- $K^* \rightarrow K^+ \pi^-$ 0.91/ 2.6 Hz   3.3/9.4 x 10^3 /hour

- $\pi^0 \rightarrow \gamma \, \gamma$ 14.6/ 69 Hz   52/ 247 x 10^3 /hour
- $\eta \rightarrow \gamma \, \gamma$ 1.5/4.9 Hz   5.5/17.7 x 10^3 /hour

- $\omega \rightarrow \pi^+ \pi^- \pi^0$ 2.6/7.8 Hz   9.5/ 28 x 10^3 /hour
- $\gamma \, p \rightarrow \pi^+ \pi^- \pi^0 \, p$ 4.7/ 30 Hz   17/110 x 10^3 /hour